Shirley Larkin 2013

Metacognitive Experiences – Taking Account of Feelings in Early Years Education

The terms metacognitive experience and early years' education fit uneasily together. There is plenty of work now on metacognition and self regulated learning in the early years and much of this will include reference to children's experience as a crucial factor in the development of both. However, there is little which focuses specifically on metacognitive experiences in the early years. In order to understand why this might be we need first to consider the development of the field of research which comes under the metacognition umbrella.

Foundations of metacognition lie in cognitive theories of memory (Cavanaugh & Borkowski, 1980; Hart, 1992); and on what children believe, understand and can articulate about memory and remembering, otherwise known as metamemory (Flavell & Wellman, 1977). Flavell and Brown (Brown, 1987; Flavell, 1976) extended the research on memory to include reflection on other cognitive processes, thereby creating the term "metacognition". The focus was often on the developmental stages from early childhood to adulthood of this ability. This was hardly surprising given Flavell's background as a Piagetian. It seemed reasonable to extend Piaget's cognitive stage development model to include children's beliefs, knowledge and understanding of their own cognitive processes. The notion of metacognition as akin to Piaget's reflective abstraction (Piaget & Inhelder, 1969) leads to the view that until children reach the level of formal operational thought they are unable to engage in metacognition. This was the consensus view of most research into metacognition until more recently when empirical studies of young children demonstrating a variety of metacognitive processes (Blair & Razza, 2007; Garrett, Mazzocco, & Baker, 2006; Jacobs, 2004; van der Zee, Hermans, & Aarnoutse, 2006) and a number of studies of non human animals (without language) also demonstrating metacognition (Kornell, Son, & Terrace, 2007; Premack & Woodruff, 1978; Smith, Shields, & Washburn, 2003) began to change this view. Theory of Mind research has shown that by the age of four children are able to understand that people think differently depending on the experience and knowledge they already have. My own research with five and six year olds used a constructivist theory of mind test (Carpendale & Chandler, 1996); a metamemory test; a mental rotation test (Estes, 1998) and a self as learner test to confirm that children of this age could not only articulate their understanding of their own cognitive processes but could also talk about their development as thinkers and the conditions under which they might think better (Larkin, 2010). The most sophisticated views of these five year olds showed that they saw learning as an active process in which they had to engage their brain and which requires practice. They described the importance of asking questions and demonstrated their understanding of learning as a complex activity involving observing, practising, acting, talking, working things out individually, and using what they already know. They also articulated the difference between observing, remembering and learning. They spoke of remembering and forgetting as emotional experiences with forgetting often linked to sadness (Larkin, 2007).

Flavell's model of metacognition as delineated in the seminal article Metacognition and Cognitive Monitoring (Flavell, 1979)comprises four "classes of phenomena" described as "metacognitive knowledge; metacognitive experiences; goals (or tasks); and actions (or strategies). In general, most research on metacognition in education has concentrated on the different aspects of metacognitive knowledge (person, task, strategy) including how these are facilitated and how they impact on learning or attainment or research has focussed on the "on-line" regulation of cognitive processes as outlined in an equally seminal paper, (Nelson & Narens, 1992). However, the second of Flavell's four

"classes of phenomena" – metacognitive experiences was largely ignored in educational research until the 1990s. However, the affective aspects of memory and learning have long been a part of the research agenda of cognitive psychologists interested in monitoring and control of cognition and memory. It is this branch of cognitive psychology which has investigated such phenomena as judgements of learning (JOL); ease of learning (EOL); feelings of confidence, familiarity and uncertainty; tip of the tongue experiences (TOT); feelings of knowing (FOK); and their determinants, cues, calibration and accuracy. For instance experimental studies show that pre-school children tend to be over-confident about the accuracy of their memory; whereas older school age children provide more accurate predictions (Schneider & Pressley, 1997). Yet whilst educationalists would agree that learning is replete with emotion as well as cognition, they have been slow to investigate the affective aspect of metacognition in classroom based studies. This may be because the adoption of metacognition theory into thinking skills interventions has often led to a skills based approach to facilitating and developing children's metacognition in different curriculum subject areas. (For a review of thinking skills programmes see (Higgins, Hall, Baumfield, & David Moseley, 2005). In the majority of these programmes the cognitive rather than the affective domain is the focus.

Metacognitive Experiences: Definitions

Metacognitive experiences are defined by Flavell (1979) as "conscious cognitive or affective experiences that accompany and pertain to any intellectual enterprise" (pg 906). Flavell is clear that metacognitive experiences include both cognitive and affective states and arise from the activation of metacognitive knowledge in response to a task. There is an interactive process between the activation of metacognitive knowledge which can cause a metacognitive experience and the activation of metacognition to interpret these experiences. For example during a task, knowledge of previous similar tasks may be consciously cued in order to aid progress on the current task or a task may cause a feeling of puzzlement which may cue metacognitive knowledge of similar incidents in order to interpret the feeling. Metacognitive experiences include feelings of confidence and puzzlement; monitoring of progress and judgements of success or failure including the feelings which accompany them. Whether conscious or not metacognitive experiences can influence progress on a task and lead to new and better processing; to revision of existing processes or to abandonment of the tasks. From a constructivist perspective on learning just as experience and interaction with the world leads to construction of new knowledge; so these meta -level experiences focussed on cognitive processes leads to the construction and revision of metacognitive knowledge. For Flavell metacognitive experiences in childhood are crucial for the development of metacognitive knowledge. However, just as children may gain inaccurate or false knowledge of the world from experience so they can develop unhelpful metacognitive knowledge of themselves as learners from the handling and resolution of metacognitive experiences.

Metacognitive experiences give rise to cognitive strategies and play a part in monitoring cognition through the interaction of metacognitive strategies, metacognitive knowledge and task goals. Metacognitive experiences are replete with emotion and highly personal as they are influenced by past and present experiences and self concept. Efklides (2001) views metacognitive experiences as influenced by three factors: 1) personal which includes ability, self concept and personality; 2) task which includes the nature of the task, previous experiences of similar tasks 3) metacognitive knowledge which includes conscious understanding and knowledge of how person, task and strategy variables might impact on task or goal. Metacognitive experiences are seen as the implicit and

explicit feelings which accompany learning and readiness to learn and which in turn influence task progression through the activation of monitoring and control processes and the activation of strategies. Efklides describes metacognitive experiences as on-line metacognition ie. feelings which happen in the moment, which change as the task goes on and which reoccur before, during and after a task. They can include ideas – light bulb moments; feelings of familiarity, difficulty, confidence, puzzlement; judgements and evaluations of strategies being used and predictions of success or failure. In this model metacognitive experiences are closely linked to self concept and motivation. Metacognitive experiences are both influenced by self concept and help to construct self concept through feedback (Dermitzaki & Efklides, 2001). Metacognitive experiences are seen as the interface between the person and the task (Efklides, 2006). As such they are particularly important elements in the creation of life-long and self regulated learners, yet they are often overlooked in classrooms.

Metacognitive Experiences in Early Years

Whilst the age at which metacognition develops in human infants has caused controversy amongst cognitive psychologists and educationalists, developmental psychologists have long been aware through experimental studies on infants that early signs of metacognition are in the affective rather than the cognitive domain. Studies on babies' attention seeking behaviour have shown that as young as 6 months old children respond to the affective state of another even when the emotion is not directed at themselves, (Reddy, 2001, 2003). The suggestion is that these very young children can demonstrate affective metacognition which is not yet cognitive. Esken (2012) discusses the work on children's social awareness and embarrassment which shows that by two years old children exhibit embarrassment indicating both an ability to view their own behaviour in relation to a social norm (Lewis, 2003) and an ability to see how others might perceive them (Lewis, 2003; Rochat, 2004). Esken (2012) goes on to suggest that there are two types of embarrassment which link to metacognitive experiences. Firstly the non-evaluative kind is a feeling of being uncomfortable as the centre of attention. It does not include any conscious understanding or reflection on the feeling and therefore could not be considered metacognitive. Secondly the evaluative type which includes a conceptual awareness of how others may be evaluating the behaviour and includes a self evaluation. Esken argues that the non-evaluative emotion may occur in non-human animals but the evaluative emotion involves a reflective consciousness and can be seen as an early step in the development of metacognition in children. As children experience more of the world around them they develop an ability to regulate and control their first order emotional responses in relation to emotions such as embarrassment. This self regulation and control is facilitated by inner speech. From a Vygotskyan perspective it could be that the child is gradually internalizing the language of the caregiver which is directed at the regulation and control of emotions. Thus the development of metacognition can be viewed as fundamentally a social process (Wertsch, 1978). The suggestion is that metacognition develops from an inter-psychological to an intra-pyschological domain (Vygotsky, 1978).

Borkowski and Thorpe (1994) demonstrated how interaction between children and adults affects the development of cognition, metacognition and motivation. In this model of metacognition importance is placed on the development of a positive sense of self which includes an internal locus of control, self esteem, resilience and positive motivational attributions. It seems likely that the early emotional experiences of young children will impact on the regulation and control of cognition. The development of these executive functions as measured by executive function tasks appears to be

closely linked to the development of theory of mind as measured by theory of mind tasks. Thus children around 4-5 years of age are able to pass both kinds of tests (Esken 2012). Theory of mind involves the understanding of others and their intentions and thus the link between theory of mind and metacognition seems to be clear. However, research on pretend play has shown that this seemingly obvious link between the development of theory of mind and the development of metacognition may not be so clear cut. The two competing claims that pretend play shows evidence of theory of mind and that pretend play is behaviourist in nature requiring only that children imitate behaviour without needing to engage in meta-representational beliefs have long dominated this area of research. However, Brandl (2012) suggests that there is a middle (although difficult and complex) ground between these two extremes. This middle ground theory emphasises the role played by metacognitive feelings. Brandl distinguishes between metacognitive judgements such as feeling of knowing, confidence judgements and feelings of uncertainty which require both the feeling and an evaluation of the feeling; and metacognitive feelings which may draw attention to an internal state without making a judgement about it. In this sense metacognitive feelings could be deemed non conceptual. Brandl argues that children gain a pleasurable sense of freedom from pretend play and that their social ability enables them to recognise the intention of others to engage in similar pleasurable activity. The argument is that by understanding the intentions of others children are able to recognise their own intentions and in turn their developing self awareness would make children more able to understand the intentions of others. Thus the metacognitive feelings of pleasure and freedom form part of a socially generated feedback loop which may account for developing metacognitive abilities. Whilst Brandl's theory is yet to be supported by weighty empirical evidence the argument is a convincing one especially when compared to anecdotal experiences of observing young children's ability to understand pretend from the slightest of behavioural cues. Metacognitive feelings then, rather than theory of mind may be crucial for the development of metacognition.

Metacognitive experiences are often transitory. They are different for different people and they are sensitive to contextual cues. They can go unrecognised, be ignored, have a negative effect on progress or they can be used to help us understand more about ourselves as learners in different contexts, (Efklides, 2006). Whilst some elements of metacognition such as non- evaluative metacognition and theory of mind develop alongside cognitive development, other aspects such as the metacognitive knowledge base and the ability to regulate and control thinking need to be consciously facilitated and fostered. It is likely that recognising and making use of our metacognitive experiences also requires some support. Whilst learning is replete with emotional responses, little attention is paid in educational settings in how to make use of those responses and how to learn from them. The next section suggests some possibilities.

Facilitating Metacognitive Experiences for Young Children

Flavell's seminal paper on cognitive monitoring (Flavell 1979) outlined the conditions under which metacognitive experiences are most likely to occur. Firstly metacognitive experiences are more likely in situations which require 'highly conscious thinking'. It would be worth recording how many tasks young children are asked to do in learning situations which actually require them to consciously think about what they are doing. Secondly, metacognitive experiences are more likely to occur in new situations which require planning and evaluation. For some learners of all ages, such situations would give rise to very stressful metacognitive experiences which rather than developing

metacognition could give rise to unhelpful metacognitive knowledge and have a debilitating effect on motivation. Clifford (1991)speaks of adventurous and cautious learners. Whilst the former relish challenge and are resilient in the face of negative emotions, the latter seek out less challenging opportunities and find negative emotions aroused by not accomplishing goals as debilitating. Thirdly metacognitive experiences are more likely where decisions and actions are authentic and carry some risk. Some nursery schools foster such decision making quite well however, as children move through the education system the content curriculum can constrain the opportunity to experience 'weightly and risky' decisions. The final element of Flavell's conditions under which metacognitive experiences should occur is in situations which are not highly emotionally charged and where extraneous factors are not impinging to the extent that they inhibit reflective thinking. Thus whilst metacognitive experiences give rise to emotions, they are most likely to occur when the external emotional climate is controlled.

Research has shown that collaborative group learning enables learners to pick up cues from the verbal and non verbal metacognitive experiences of their co-learners. The monitoring of these cues can lead to shared metacognitive experiences and to shared and co-regulation, (Iiskala, Vauras, & Lehtinen, 2004; Salonen, Vauras, & Efklides, 2005). However, as my own research into 5 and 6 year olds collaborating on writing tasks has shown, when left unsupported these metacognitive experiences do not necessarily result in more metacognitive behaviour. I found that high levels of social co-operation, support and collaborative talk ie. what would look like 'good partnership work' in a classroom setting did not always lead to metacognition. Some elements of collaborative partnerships which did give rise to metacognitive behaviour were task oriented motivation; co-operative rather than competitive interaction; attention to task instructions; degree of joint ownership of the task; periods of talk interspersed with silence and periods of writing and emotional stability or calmness (Larkin, 2009).

In order to create metacognitive experiences for young learners, adults need to deliberately structure situations which are more likely to give rise to such experiences. There are many commercially available thinking skills programmes which include some elements of metacognition. However, these have not all been empirically tested and researched. One programme designed for 5-6 year olds which is based on sound theoretical principles and which has undergone research evaluation is the Let's Think programme (Adey, Robertson, & Venville, 2001). Evaluation showed that overall *Let's Think!* has significant effects on children's cognitive ability (Adey, Robertson, & Venville, 2002). There are four basic features or pillars of any CASE programme: cognitive conflict; social construction; metacognition; bridging/transfer.

Cognitive conflict refers to presenting children with something puzzling or unexpected. This is not simply a matter of presenting difficult or challenging material. Rather it is about providing experiences which confound children's thinking; which make them reflect and think again about what they appear to know. Creating cognitive conflict is likely to lead to metacognitive experiences as children feel puzzled, experience difficulty and frustration. Many of the Let's Think tasks for 5-6 year olds are based on open ended questions ie. there is no one right answer but different answers can be equally valid. This more closely resembles real world problems and whilst the activities may be based on schemata such as categorization and seriation they are contextualised by narrative stories. For example one task involves children inventing a game using all the materials provided: a ball, a die and shaker and a hula hoop. The cognitive conflict comes through trying to use all of the

apparatus; ensuring that all members of the group of six children are involved in the process; creating a game which is fair and reliable and managing conflicting feelings and ideas within the group. The children also have to be able to teach the game to another group, thus experiencing the role of tutor.

Social Construction is described by Vygotsky (1979) as a process of semiotic mediation, which is dynamic and interactive and where knowledge is constructed through the manipulation of psychological tools, the most apparent of which is language. In the Let's Think tasks children create and construct knowledge together in social groups; explaining and negotiating, learning to listen and to respond appropriately; knowing when to argue a point and when to accept another's view. In order to facilitate social construction the classroom environment including the physical layout of the classroom; the number and type of resources allocated to the group and the make up of the group are factors in helping or hindering collaborative work. Metacognitive experiences are created through this social construction process. Children may feel that they are being overlooked, not taken seriously, that they have little to contribute or that they are too shy or embarrassed to put forward their own ideas. In order to create constructive metacognitive experiences in collaborative group work the adult needs to observe and respond to the verbal and non verbal cues of individuals within the group.

The third pillar of CASE activities is metacognition. It is important that this is not seen as a simple reflection on learning at the end of an activity. Instead the fostering of metacognition through the creation of metacognitive experiences runs throughout the task from planning to evaluation. The Let's Think activities meet the requirements set out by Flavell to stimulate metacognitive experiences. Making use of the metacognitive experiences which arise during these collaborative tasks requires the adult facilitator to create a learning space where failure to come up with an easy and right answer is seen as positive rather than negative; where difficulty is experienced as pleasurable rather than debilitating and where social nicety is not allowed to dominate the cognitive challenge. Young children are socialised to help, be kind to and share with others. Yet in problem solving tasks this can become an issue if children for example, give resources to another child because this is the "kind thing to do" rather than because this will help the group to solve the problem.

The fourth pillar of CASE refers to bridging and transfer ie. the ability to use the knowledge constructed on one specific task and transfer that to other similar tasks or to other kinds of tasks. This requires an ability to abstract general principles from specific situations and reapply them in new situations. In terms of metacognitive experiences the successful transfer of learning from one domain to another is likely to produce feelings of satisfaction and empowerment. The positive metacognitive experiences arising from successful transfer of learning is likely to lead to new thinking; to develop the metacognitive knowledge base and to enhance regulation and control of thinking.

Attribution of cause and outcome of emotions and how they might be regulated are likely to differ amongst a group of learners just as the strength of the emotions felt will differ (Graesser, D'Mello, & Person, 2009) and it is important that teachers are able to respond to these different emotions appropriately. Many teachers do this instinctively but teacher training programmes rarely focus on how emotion and feelings might affect learning. Understanding the importance of metacognitive

experiences for young children and how to facilitate them may go someway towards reinstating the importance of feelings in early years' education.

References

Adey, P., Robertson, A., & Venville, G. (2001). Let's Think! A Programme for Developing Thinking in Five and Six Year Olds. Slough: Nfer Nelson.

Adey, P., Robertson, A., & Venville, G. (2002). Effects of a cognitive acceleration programme on Year 1 pupils. *British Journal of Educational Psychology, 72*, 1-25.

Blair, C., & Razza, R. P. (2007). Relating Effortful Control, Executive Function, and False Belief Understanding to Emerging Math and Literacy Ability in Kindergarten. *Child Development, 78*(2), 647-663.

Borkowski, J. G., & Thorpe, P. K. (1994). Self-Regulation and Motivation: A Life-Span Perspective on Underachievement. In D. H. Schunk & B. J. Zimmerman (Eds.), *Self-regulation of learning and performance: Issues and educational applications* (pp. 45-100). Hillsdale, NJ: Erlbaum.

Brandl, J. L. (2012). Pretend play in early childhood: the road between metalism and behaviourism. In M. J. Beran, J. L. Brandl, J. Perner & J. Proust (Eds.), *Foundations of Metacognition* (pp. 146-166). Oxford: Oxford University Press.

Brown, A. L. (1987). Metacognition, Executive Control, Self-Regulation and Other More Mysterious Mechanisms. In F. E. Weinert & R. H. Kluwe (Eds.), *Metacognition, Motivation and Understanding* (pp. 65-116). Hillsdale, N.J.: Erlbaum.

Carpendale, J. I., & Chandler, M. J. (1996). On the Distinction between False Belief Understanding and Subscribing to an Interpretive Theory of Mind. *Child Development, 67*, 1686-1706.

Cavanaugh, J. C., & Borkowski, J. G. (1980). Searching for metamemory-memory connections. A developmental study. *Developmental Psychology, 16*, 441-453.

Clifford, M. M. (1991). Risk taking: Theoretical, empirical and educational considerations. *Educational Psychologist, 26*, 263-298.

Dermitzaki, I., & Efklides, A. (2001). Age and gender effects on students' evaluations regarding the self and task-related experiences in mathematics. In S. Volet & S. Jarvela (Eds.), *Motivation in learning contexts: Conceptual advances and methodological implications* (pp. 271-293). Amsterdam: Elsevier.

Efklides, A. (2001). Metacognitive experiences in problem solving: Metacognition, motivation and self regulation. In A. Efklides, J. Kuhl & R. M. Sorrentino (Eds.), *Trends and prospects in motivation research* (pp. 297-323). Dordrecht, The Netherlands: Kluwer.

Efklides, A. (2006). Metacognition and affect: What can metacognitive experiences tell us about the learning process? *Educational Research Review*, 3-14.

Esken, F. (2012). Early forms of metacognition in human children. In M. J. Beran, J. L. Brandl, J. Perner & J. Proust (Eds.), *Foundations of Metacognition* (pp. 134-145). Oxford: Oxford University Press.

Estes, D. (1998). Young Children's Awareness of Their Mental Activity:The Case of Mental Rotation. *Child Development, 69*(5), 1345-1360.

Flavell. (1976). Metacognitive aspects of problem solving. In L. B. Resnick (Ed.), *The Nature of Intelligence* (pp. 231-235). Hillsdale, N.J.: Erlbaum.

Flavell. (1979). Metacognition and Cognitive Monitoring. *American Psychologist, 34*(10), 906-911.

Flavell, & Wellman, H. M. (1977). Metamemory. In R. V. Kail & J. W. Hagen (Eds.), *Perspectives on the development of memory and cognition* (pp. 3-33). Hillsdale: Erlbaum.

Garrett, A. J., Mazzocco, M. M. M., & Baker, L. (2006). Development of the Metacognitive Skills of Prediction and Evaluation in Children With or Without Math Disability. *Learning Disabilities Research & Practice, 21*(2), 77-88.

Graesser, A. C., D'Mello, S., & Person, N. (2009). Meta-Knowledge in Tutoring. In D. J. Hacker, J. Dunlosky & A. C. Graesser (Eds.), *Handbook of Metacognition in Education* (pp. 361-382). New York: Routledge.

Hart, J. T. (1992). Memory and the Feeling of Knowing Experience. In T. O. Nelson (Ed.), *Metacognition: Core Readings* (pp. 133-141). Needham Heights, MA: Allyn and Bacon.

Higgins, S., Hall, E., Baumfield, V., & David Moseley. (2005). *A meta-analysis of the impact of the implementation of thinking skills approaches on pupils*. London: EPPI Centre, Social Science Research Unit, Institute of Education, University of London.

Iiskala, T., Vauras, M., & Lehtinen, E. (2004). Socially shared metacognition in peer learning? *Hellenic Journal of Psychology, 1*, 147-178.

Jacobs, G. M. (2004). A Classroom Investigation of the Growth of Metacognitive Awareness in Kindergarten Children through the Writing Process. *Early Childhood Education Journal, 32*(1), 17-23.

Kornell, N., Son, L. K., & Terrace, H. S. (2007). Transfer of Metacognitive Skills and Hint Seeking in Monkeys. *Psychological Science, 18*(1), 64-71.

Larkin, S. (2007). A phenomenological analysis of the metamemory of 5-6 year old children. *Qualitative Research in Psychology, 4*(4), 281-293.

Larkin, S. (2009). Socially mediated metacognition and learning to write. *Thinking Skills and Creativity, 4*, 149-159.

Larkin, S. (2010). *Metacognition in Young Children*. Abingdon, Oxon: Routledge.

Lewis, M. (2003). The development of self-consciousness. In J. Roessler & M. Eilan (Eds.), *Agency and self-awareness: Issues in philosophy and psychology* (pp. 275-295). Oxford: Oxford University Press.

Nelson, T. O., & Narens, L. (1992). Metamemory: A Theoretical Framework and New Findings. In T. O. Nelson (Ed.), *Metacognition Core Readings* (pp. 117-129). MA: Allyn and Bacon.

Piaget, J., & Inhelder, B. (1969). *The Psychology of the Child* (H. Weaver, Trans.). London: Routledge & Kegan Paul.

Premack, D., & Woodruff, G. (1978). Does the chimapanzee have a theory of mind ? *Behavioural and Brain Sciences, 1*, 515-526.

Reddy, V. (2001). Infant Clowns. *Enfance*, 247-256.

Reddy, V. (2003). On being the object of attention: Implications for self-other consciousness. *Trends in Cognitive Sciences, 7*(9), 397-402.

Rochat, P. (2004). *The infant's world*. Cambridge, MA: Harvard University Press.

Salonen, P., Vauras, M., & Efklides, A. (2005). Social interaction: What can it tell us about metacognition and co-regulation in learning? *European Psychologist, 10*, 199-205.

Schneider, W., & Pressley, M. (1997). *Memory Development Between Two and Twenty* (2nd ed.). Mahwah NJ: Lawrence Erlbaum Associates.

Smith, J. D., Shields, W. E., & Washburn, D. A. (2003). The comparative psychology of uncertainty monitoring and metacognition. *BEHAVIORAL AND BRAIN SCIENCES, 26*(3), 317-373.

van der Zee, T., Hermans, C., & Aarnoutse, C. (2006). Primary school students' metacognitive beliefs about religious education. *Educational Research and Evaluation, 12*(3), 271-293.

Vygotsky, L. S. (1978). *Mind in Society*. Cambridge, MA: Harvard University Press.

Wertsch, J. V. (1978). Adult-child interaction and the roots of metacognition. *Quarterly Newsletter of the Institute for Comparative Human Development, 2*, 15-18.